**Pre-Calculus**

* 1. **Notes**

**Day 10**

1. **The inverse of a function**

* Denoted by f-1 for function f
* Functions f and f-1 have the effect of “undoing” each other. When you find f(f-1(x)) or f-1(f(x)), you obtain the identity function:

f(f-1(x)) = x = f-1(f(x))

* To find the inverse function:

1. Interchange y and x
2. Solve for y
3. Replace y with f-1(x)

**Ex. 1:** Find the inverse of f(x) = 4x and verify that f(f-1(x)) = f-1(f(x)) = x

**Ex. 2:** Find the inverse of f(x) = x – 6 and verify that f(f-1(x)) = f-1(f(x)) = x

* Note: The domain of f = range of f-1 and the range of f = domain of f-1

**Ex. 3:** y = x + 2 Let x = 0, 1, 2, 3

y =

Find the inverse and state the domain and range.

**Ex. 4:** Show that f(x) = 2x3 – 1 and g(x) = are inverses of each other.

**Ex. 5:** Find the inverse of f(x) = .

1. **The graph of the inverse of a function**

* If point (a, b) is on the graph of f then (b, a) is on f-1
* This means f-1 is a reflection of f about the y = x line.

**Ex. 6:** Sketch f(x) = 2x – 3 and its inverse function f-1(x) = (x + 3)

**Ex. 7:** Sketch f(x) = x2 for x ≥ 0; f-1(x) =

* Horizontal Line Test: a function f has an inverse iff a horizontal line hits only 1 point.

**Ex. 8:** Do the following functions have an inverse?